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UTILITY PATENT APPLICATION TRANSMITTAL
(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.   042390.P9709   Total Pages   3

First Named Inventor or Application Identifier Arvind Kumar

Express Mail Label No. EL627466150US

ADDRESS TO:	**Assistant Commissioner for Patents** **Box Patent Application** **Washington, D. C. 20231**

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

1.   __X__   **Fee Transmittal Form**
(Submit an original, and a duplicate for fee processing)

2.   __X__   **Specification**   (Total Pages ___17___)
(preferred arrangement set forth below)
- Descriptive Title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings (if filed)
- Detailed Description
- Claims
- Abstract of the Disclosure

3.   __X__   **Drawings(s) (35 USC 113)**   (Total Sheets _5_)

4.   __X__   **Oath or Declaration & POA**   (Total Pages _5_)

   a.   _X_   (unexecuted)

   b.   ___   Copy from a Prior Application (37 CFR 1.63(d))
(for Continuation/Divisional with Box 17 completed) **(Note Box 5 below)**

   i.   ___   DELETIONS OF INVENTOR(S) Signed statement attached deleting
inventor(s) named in the prior application, see 37 CFR 1.63(d)(2)
and 1.33(b).

5.   _   Incorporation By Reference (useable if Box 4b is checked)
The entire disclosure of the prior application, from which a copy of the oath or
declaration is supplied under Box 4b, is considered as being part of the
disclosure of the accompanying application and is hereby incorporated by
reference therein.

6.   _   Microfiche Computer Program (Appendix)

7. __ Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
    a. ____ Computer Readable Copy
    b. ____ Paper Copy (identical to computer copy)
    c. ____ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

8. __ Assignment Papers (cover sheet & documents(s))
9. __ a. 37 CFR 3.73(b) Statement (where there is an assignee)

    __ b. Power of Attorney

10. __ English Translation Document (if applicable)

11. __ a. Information Disclosure Statement (IDS)/PTO-1449

    __ b. Copies of IDS Citations

12. __ Preliminary Amendment

13. _X_ Return Receipt Postcard (MPEP 503) (Should be specifically itemized)

14. __ a. Small Entity Statement(s)

      b. Statement filed in prior application, Status still proper and desired

15. __ Certified Copy of Priority Document(s) (if foreign priority is claimed)

16. __ Other: Check in the Amount of: $858.00

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17. **If a CONTINUING APPLICATION,** check appropriate box and supply the requisite information:

____ Continuation   ____ Divisional   ____ Continuation-in-part (CIP)

of prior application No: __

---

18. **Correspondence Address**

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UNITED STATES PATENT APPLICATION

FOR

INTERNET BASED NETWORK TOPOLOGY DISCOVERY

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INTERNET BASED NETWORK TOPOLOGY DISCOVERY

FIELD OF THE INVENTION

This invention relates generally to computer network or systems management

5   and, more particularly, to discovery of network devices.

BACKGROUND OF THE INVENTION

The task of computer network and systems management is challenged with the

complexities of the systems networked in variety of ways. With large numbers of

connected computers and other devices, it is difficult to manage a network. Many

10   common network management tools use a process called "discovery of the network."

Discovery of a network of computers or other devices typically involves finding

information about which devices are connected to the network. Among the categories

of information discovered are, for example, IP addresses of the devices, types of

devices, or capabilities of the devices. Among the networked devices that can be

15   "discovered" are computers, printers, servers, switches, modems, etc.

The discovery data of a network is typically used for network management or

administration. The data can be formatted into a table or a network "tree" which can

then be displayed or manipulated for network management purposes.

Typical network management tools use various ways to discover the network.

20   Most of these are not scalable and break down for the discovery of systems on the

Internet. One example of a network discovery method is commonly referred to as a

"ping sweep" method. In the ping sweep method, an operator or network administrator

sends individual queries to the network from a console. The queries, or "pings," are

messages to the network that are directed to a particular device or group of devices that

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respond with a return message. One example of a ping sweep network search method requires the network administrator to search by IP addresses, incrementing the last digit (or set of digits) of the IP address, for example, until a particular device with the generated IP address is found. The ping sweep method of network discovery is a time

5   consuming manual process. Network traffic is also increased when the ping sweep method is used. One way to shorten time required for a ping sweep search is to use a broadcast method. Broadcasting a ping sweep, however, also creates added network traffic.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is illustrated by way of example, and not limitation, in the figures of the accompanying drawings in which:

FIGURE 1 is a flowchart showing one embodiment of a method of the present invention;

FIGURE 2 is a schematic of a network showing an embodiment of a system of the present invention;

FIGURE 3 is a schematic of a network showing another embodiment of a system of the present invention;

FIGURE 4 is an example of an XML based document;

FIGURE 5 is a table showing an example of discovery information retrieved from a network; and

FIGURE 6 is a table showing an example of manipulated discovery information.

DETAILED DESCRIPTION

The present invention includes unique ways to discover systems or devices on a network. Extensible Markup Language (XML) based data is used to share the discovery information over Internet transport. It allows for an efficient use of Internet content

5   search engines in processing the data. Network topology maps may be created based on the information discovered.

Discovery information, such as identification, location, or capability data, is stored on the devices of a network in the form of XML documents. The discovery information about the networked systems or devices is exchanged using XML/HTTP

10   protocols. Powerful XML based search engines are used for Internet content filtering and retrieval. A combination of these two technologies renders a tool for dynamically building network maps based on the discovery information that is queried and retrieved from the various XML documents on the networked devices. The network nodes can then be further classified based on the node types and other parameters. Specific

15   network maps for a specific management domain can then be rendered.

The particular methods of the invention can described with reference to the flowchart shown in FIGURE 1 in which one embodiment of the method 100 constitutes processes and operations represented by block 102 until 108. Embodiments of the method may constitute computer programs made up of computer-executable instructions

20   illustrated as blocks 102 until 108 in FIGURE 1.

Describing the methods by reference to a flowchart enables one skilled in the art to develop such programs including such instructions to carry out the methods on suitably configured computers (the processor of the computer executing the instructions from computer-readable media). If written in a programming language conforming to a

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recognized standard, such instructions can be executed on a variety of hardware

platforms and for interface to a variety of operating systems. In addition, the present

invention is not described with reference to any particular programming language. It

will be appreciated that a variety of programming languages may be used to implement

5   the teachings of the invention as described herein. Furthermore, it is common in the art

to speak of software, in one form or another (e.g., program, procedure, process,

application, module, logic, etc.), as taking an action or causing a result. Such

expressions are merely a shorthand way of saying that execution of the software by a

computer causes the processor of the computer to perform an action or a produce a

10   result.

Embodiments of the invention can include software stored or transmitted on or

by a machine-readable medium. Thus, a machine-readable medium includes any

mechanism that provides (i.e., stores and/or transmits) information in a form readable by

a machine (e.g., a computer). For example, a machine-readable medium includes read

15   only memory (ROM); random access memory (RAM); magnetic disk storage media;

optical storage media; flash memory devices; electrical, optical, acoustical or other form

of propagated signals (e.g., carrier waves, infrared signals, digital signals, etc.); etc.

FIGURE 1 shows a flowchart of an exemplary method 100 of the present

invention in which the various blocks represent operations or procedures to perform the

20   method 100. Block 102 shows the operation of formulating a discovery information

query. Block 104 shows the operation of sending the discovery information query to an

XML based search engine to search for discovery information of at least one network

device.

Formulating the discovery information query can be performed at a console or at one of the devices on the network. For example, a user can formulate and input a query at an end user station such as a personal computer that is connected to the network. The XML based search engine then searches the network for discovery information that is on

5   the device or devices that are being searched. The discovery information is in XML format that is preferably standardized. The XML discovery information is described in further detail below.

Additional operations that can be performed in the method 100 are represented by blocks 106 and 108. Block 106 shows the optional operation of manipulating

10   discovery information retrieved by the XML-based search engine from a discovery document on the network device. As discussed in further detail below, the retrieved XML information can be transposed or manipulated to yield a network map, topology, or tree that can be displayed for the user. Block 108 shows the optional operation of displaying the manipulated discovery information.

15   FIGURE 2 shows an exemplary embodiment of a system 110 of the present invention. System 110 includes a network 120. Network 120 can be any type of network that has a plurality of devices or systems associated with it. Exemplary embodiments of network 120 can include a local area network (LAN) or a wide area network (WAN). For purposes of description of the present invention, it should be

20   noted that the Internet can be considered a collection of networks or a large network by itself.

In the exemplary system 110 shown in FIGURE 2, a user 130 formulates a query to send to the network 120 through an XML based search engine 140. The XML based search engine can include a query formulation device in which the user 130 inputs the

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parameters that are to be searched. The network 120 can be searched for a particular

type of device 160 to discover information about the device such as how many of that

type of device are connected or operating, the status of all such devices, or the

capabilities of particular devices such as whether a particular printer is post-script

5   enabled or has color capability, for example. In another example, the IP addresses can

be discovered which can provide information about the location or type of device.

Examples of devices 160 or systems that can be discovered include switches, routers,

servers, printers, computer, etc.

The system 110 can include devices that manage other devices such as device

10   180. As shown in FIGURE 2, device 180 manages managed devices 190. Managing

device 180 can be referred to as a proxy system.

Each device 160, 180, and 190 can include its own XML discovery information.

Alternatively, the proxy system or managing device 180 can include XML discovery

information about its managed devices 190.

15   FIGURE 3 shows another example of a network on which the discovery method

of a present invention can be used. The systems A, B, C, D & E are systems on the

network that can be managed by the Console system. These systems can either be

directly discovered and managed by the console, or they can be managed via a third

system (Proxy System). In FIGURE 3, Systems X, Y and Z are proxy systems. The

20   broad arrows indicate the systems managed by each proxy system.

It should be noted that the systems in FIGURE 3 are identified as "Proxy" and

"Managed" systems for illustration purposes only. In the real world, the systems A, B,

or C could also act as Proxy for D and E, for example. Systems X and Y could also be

the managed systems.

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System Discovery Information

Implementation of the present invention preferably includes devices on the network that have their individual discovery/identification data in a standard format.

5   This format is preferably based on Extensible Markup Language (XML). Using XML definitions, a well-structured information content document is published by the devices or systems. Furthermore, defining an XML format allows this information to be routed through HTTP and through firewalls, thus making this information available anywhere and anytime.

10   FIGURE 4 shows an example of an XML file 200 that can be provided on networked devices. XML file 200 can be referred to as a discovery document containing discovery information. The discovery information in XML file 200 can provide many categories of information. For example, line 210 which reads "<ManageOthers>True</ManageOthers>" indicates that the device associated with

15   XML file 200 is a "proxy" system such as a server that manages other devices or systems.

Another example of the discovery information that may by contained in an XML file is represented by the set of lines 220. The set of lines indicated by reference numeral 220 includes discovery information about the devices that are managed by the

20   proxy device. An example of a proxy device or system is a server. Locating the XML file 200 on a proxy device allows the various network devices such as printers, routers, switches, etc. to not have their own XML files. The server, for example, can retrieve the information about the various devices that it manages through current protocols when an XML based network discovery search is performed. The search engine, in this

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case, need only query the server. If desired, the search engine can be directed to query only particular portions of the XML file. For example, a search can be made that is directed only to the "other managed nodes" section of the XML file 200.

The discovery information is in XML format because XML search engines are used to conduct the network discovery. Many devices currently in use, however, do not include an XML file that includes such information. Modification or replacement of current network devices is not necessary, however, because proxy system can be used to store the information about the various devices.

Making Discovery Information Available

The discovery information encoded in the XML file on the device can be supplied to any consumer of the data. Any protocol for transfer can be used. The Internet standard HyperText Transfer Protocol (HTTP) is very well suited for transferring XML content from one system to another, and is the preferred protocol. The system providing this data can publish a URL containing the XML data. As long as the URL is available somewhere, the specific location of the URL is not important.

For example, the URL containing the XML data for a particular device can be located on a server. An example of such a URL could be http://www.server1.myorg/ManagedCapabilities. In another example, the XML can be embedded on a router and can have the exemplary URL http://192.9.200.34/. In yet another example, a management system which collects data from multiple devices can include the exemplary URL http://www.ManagementServer.myorg/ManagedDevices. In yet another example, a device on "my" local network could include the exemplary URL http://mydevice:80/data.

XML Search Engines

The present invention utilizes power of available Internet search engines. These search engines provide a good way to search for the content on the Internet. Typically, these search engines search for text in the HTML or other text documents, and report results that are the closest match. Some of the search engines provide enhanced capabilities to match keywords (specified in the documents) and thus provide better search results. Building upon this, an XML based search engine searches data under specific XML tags, and thus provides very accurate results.

To illustrate this, a search for ManagedNode/NodeType/Category="Server" will only return the XML documents that contain Server systems. The search engine will limit the search to the above XML tag (as specified by a specific document type definition or "DTD"). Thus, it will not retrieve thousands of documents containing the word "Server."

Manipulating the Discovery Information

The discovery information can contain not only the particular system or device identification data, but also the information about other systems or devices that can be managed through the particular system or device on which the discovery information is stored.

Once the Console system performs an XML search using the search engine, it essentially has the XML documents from all the systems on the managed network. These XML documents are from all the managed systems as well as from the Proxy

systems. Of course, the Console system could limit the search to a specific tag, and only retrieve documents of relevance.

FIGURE 5 shows an example of a table of information that can be retrieved by the Console system in the process of creating a network map of the network shown in FIGURE 3. The next task for the console is to transpose the table of FIGURE 5 with the focus on the managed system, and how it can be reached via different alternate paths. This will yield the table shown in FIGURE 6.

Based on the table of FIGURE 6, the network map in the Console will be updated to reflect that a system is manageable and contains the information necessary to manage the system. For example, referring to FIGURE 6, the system B on the network map reflects the status of the system, and the fact that it can be managed directly from the Console. This will be true even if the operating system on system B is crashed/hung. The system is still available through Y or Z. If Y goes down, the system is still available through Z. If Z is also down, then the management launch point is disabled.

These components together create a powerful mechanism to allow network and systems management tools to create a generic network topology map or table, describe the systems on the network, and provide ways to manage these systems effectively.

In the foregoing specification, the invention has been described with reference to specific exemplary embodiments thereof. It will, however, be evident that various modifications and changes may be made thereto without departing from the broader spirit and scope of the invention as set forth in the appended claims. The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense.

CLAIMS

What is claimed is:

1   1.   A method comprising:

2   formulating a discovery information query;

3   sending said discovery information query to an extensible markup language

4   (XML)-based search engine to search for discovery information of at least one network

5   device.

1   2.   The method of claim 1 further comprising retrieving discovery

2   information from a discovery document on the at least one network device.

1   3.   The method of claim 2 further comprising manipulating the retrieved

2   discovery information.

1   4.   The method of claim 3 further comprising displaying the manipulated

2   discovery information.

1   5.   A machine-readable medium that provides instructions, which when

2   executed by a machine, cause said machine to perform operations comprising:

3   searching for discovery information of at least one network device using an

4   extensible markup language (XML)-based search engine.

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1   6.   The machine-readable medium of claim 5 further comprising formulating

2   a discovery information query to be sent to the XML-based search engine.

1   7.   The machine-readable medium of claim 5 further comprising retrieving

2   discovery information from a discovery document on the network device.

1   8.   The machine-readable medium of claim 7 further comprising

2   manipulating the retrieved discovery information.

1   9.   The machine-readable medium of claim 8 further comprising displaying

2   the manipulated discovery information.

1   10.   A system comprising:

2   means for searching for discovery information of at least one network device

3   using an extensible markup language (XML)-based search engine.

1   11.   The system of claim 10 further comprising means for formulating a

2   discovery information query to be sent to the XML-based search engine.

1   12.   The system of claim 10 further comprising means for retrieving

2   discovery information from a discovery document on the network device.

1   13.   The system of claim 12 further comprising means for manipulating the

2   retrieved discovery information.

1   14.   The system of claim 13 further comprising means for displaying the

2   manipulated discovery information.

1   15.   An apparatus comprising:

2   a network device including XML based discovery information.

1   16.   The apparatus of claim 15 wherein said XML based discovery

2   information is in the form of an XML file stored on said network device.

1   17.   The apparatus of claim 15 wherein the network device is a router.

1   18.   The apparatus of claim 15 wherein the network device is a switch.

1   19.   The apparatus of claim 15 wherein the network device is a server.

1   20.   The apparatus of claim 15 wherein the network device is a computer.

1   21.   The apparatus of claim 15 wherein the network device is a printer.

1   22.   The apparatus of claim 15 wherein the network device manages other

2   network devices.

1   23.   The apparatus of claim 15 wherein the XML based discovery information

2   includes data describing the capabilities of the network device.

1   24.   The apparatus of claim 23 wherein the XML based discovery information

2   includes data describing the location of the network device.

1   25.   The apparatus of claim 23 wherein the XML based discovery information

2   includes data describing the type of the network device.

ABSTRACT

A method and apparatus for internet based network topology discovery.
Extensible Markup Language (XML) based data is used to share the discovery
information of devices on a network over Internet transport. XML based search engines
5   are used to search for the discovery information. Discovery information, such as
identification, location, or capability data, for example, is stored on the devices of a
network in the form of XML documents. Network topology maps may be created based
on the information discovered.

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┌─────────────────────────────────────────────────────────────────────┐
│            Formulating a discovery information query.                 │
│                                                                       │
│                                                              102      │
└─────────────────────────────────────────────────────────────────────┘
                                    │
                                    │
                                    ▼
┌─────────────────────────────────────────────────────────────────────┐
│  Sending the discovery information query to an extensible markup      │
│  language (XML)-based search engine to search for discovery           │
│  information of at least one network device.                          │
│                                                              104      │
└─────────────────────────────────────────────────────────────────────┘
                                    │
                                    │
                                    ▼
┌─────────────────────────────────────────────────────────────────────┐
│  (Optional) Manipulating discovery information retrieved by the       │
│  XML-based search engine from a discovery document on the network     │
│  device.                                                              │
│                                                              106      │
└─────────────────────────────────────────────────────────────────────┘
                                    │
                                    │
                                    ▼
┌─────────────────────────────────────────────────────────────────────┐
│      (Optional) Displaying the manipulated discovery information.     │
│                                                                       │
│                                                              108      │
└─────────────────────────────────────────────────────────────────────┘
```

FIG. 1

110

Networked
Device
160

Networked
Device
160

Network
120

XML based
Search
Engine
140

User
130

Networked
Device
160

Device
Managing
Others
180

Managed
Device
190

Managed
Device
190

FIG. 2

Proxy Systems   Managed Systems

Systems Managed by Proxy

FIG. 3

```xml
<?xml version="1.0" encoding="UTF-8"?>
<ManagedNode>
  <Name>
      <DisplayName>ComputerX</DisplayName>
      <FullyQualifiedName>example.domain.com</FullyQualifiedName>
  </Name>
  <Address>
      <AddressType>IP</AddressType>
      <AddressValue>11.22.33.44</AddressValue>
  </Address>
  <Address>
      <AddressType>Modem</AddressType>
      <AddressValue>(503) 987-6543</AddressValue>
  </Address>
  <NodeType>
      <Category>Server</Category>
      <Usage>WebHead</Usage>
  </NodeType>
  <Capabilities>
      <ManageSelf>True</ManageSelf>
      <ManageOthers>True</ManageOthers>
  </Capabilities>
  <OtherManagedNodes>
      <ManagedNode>
          <Name>
              <DisplayName>ComputerA</DisplayName>
              <FullyQualifiedName>ComputerA.mydomain.com</FullyQualifiedName>
          </Name>
          <Address>
              <AddressType>IP</AddressType>
              <AddressValue>12.34.56.78</AddressValue>
          </Address>
          <Address>
              <AddressType>Modem</AddressType>
              <AddressValue>(321) 345-6789</AddressValue>
          </Address>
          <NodeType>
              <Category>Server</Category>
              <Usage>Database Server</Usage>
          </NodeType>
          <Capabilities>
              <ManageSelf>True</ManageSelf>
              <ManageOthers>False</ManageOthers>
          </Capabilities>
      </ManagedNode>
      <ManagedNode>
          <Name>
              <DisplayName>ComputerB</DisplayName>
              <FullyQualifiedName>ComputerB.mydomain.com</FullyQualifiedName>
          </Name>
          <Address>
              <AddressType>IP</AddressType>
              <AddressValue>12.34.56.01</AddressValue>
          </Address>
          <NodeType>
              <Category>Desktop</Category>
              <Usage>Client System</Usage>
          </NodeType>
          <Capabilities>
              <ManageSelf>True</ManageSelf>
              <ManageOthers>False</ManageOthers>
          </Capabilities>
      </ManagedNode>
  </OtherManagedNodes>
</ManagedNode>
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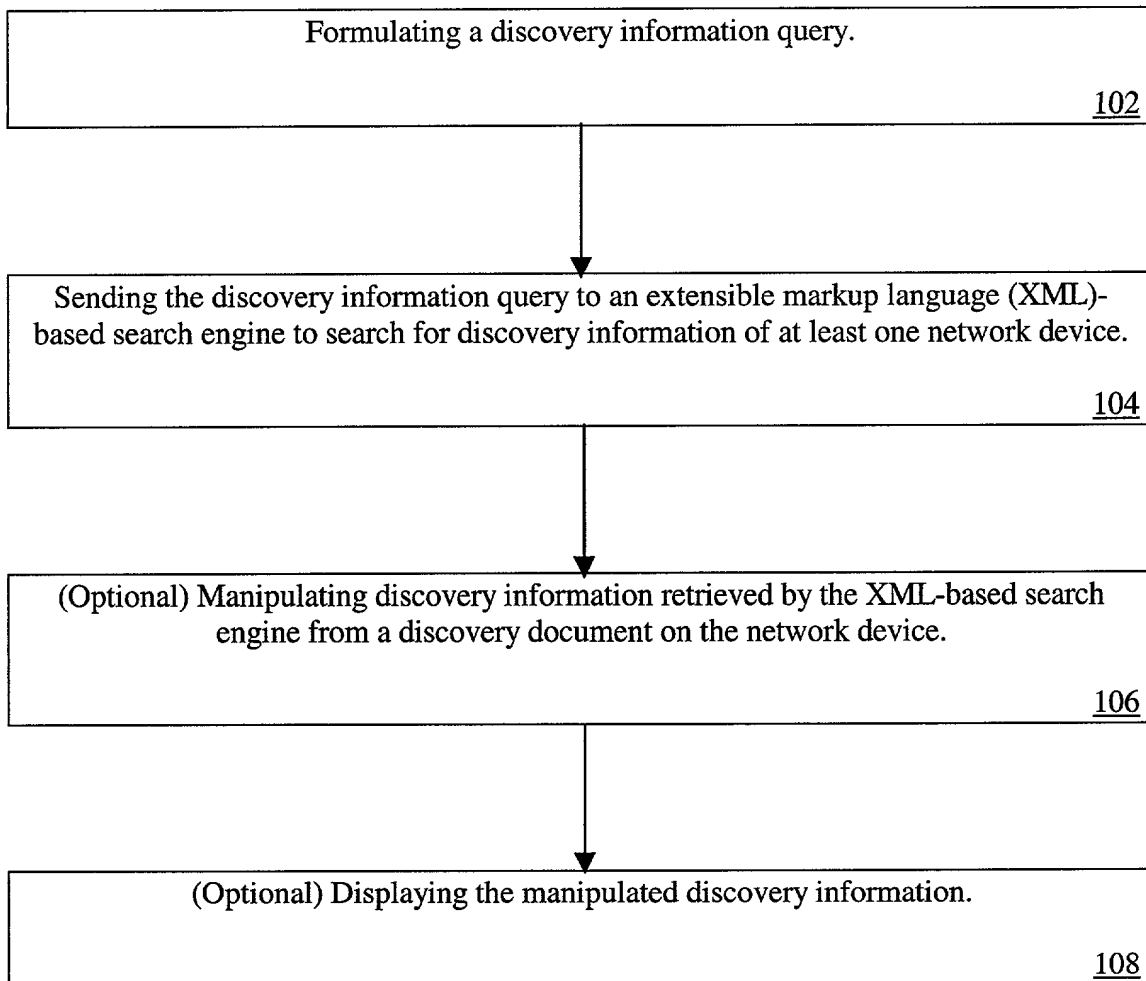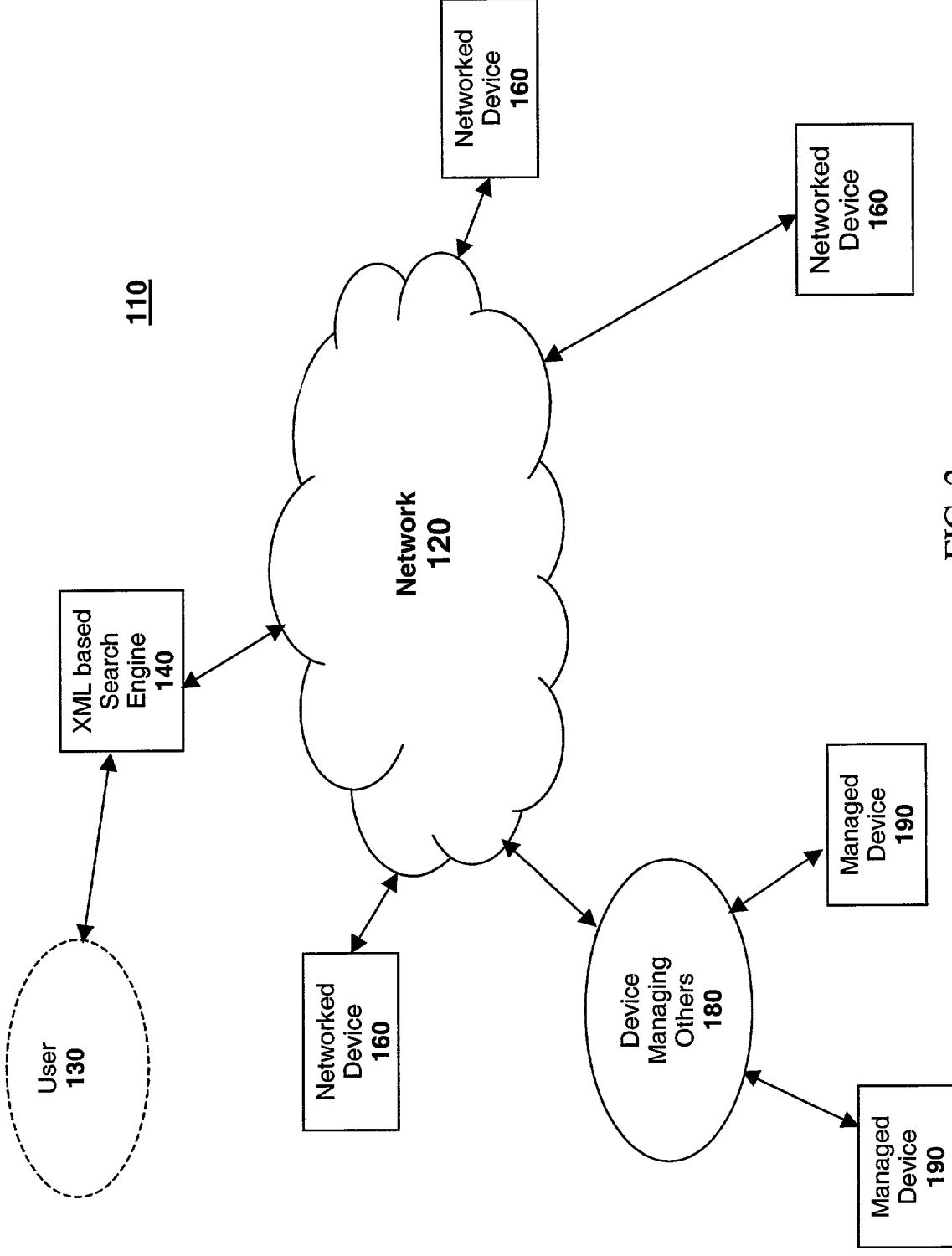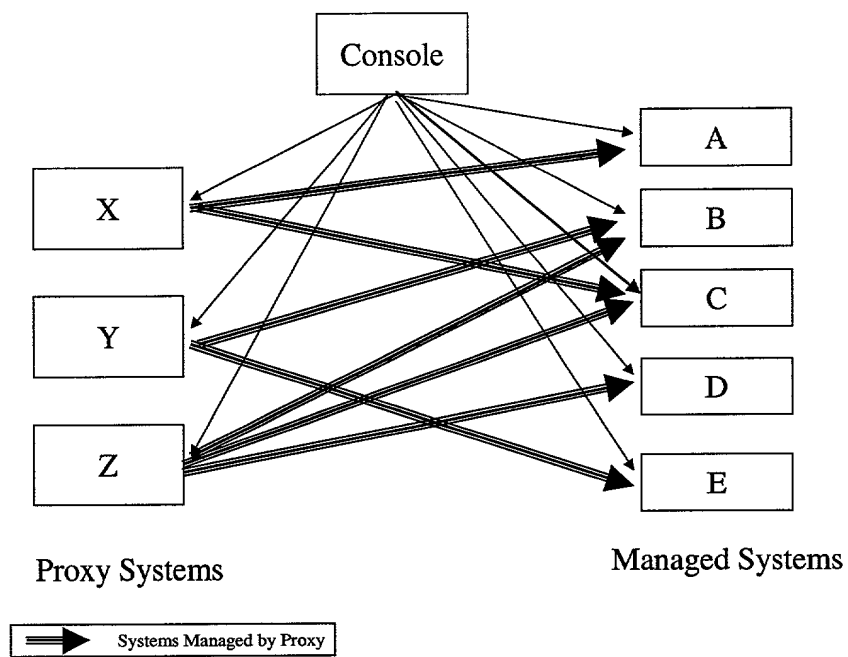
200

210

220

FIG. 4

Managed Node Name	Managed Node Capabilities. ManageSelf	Managed Node Capabilities. ManageOthers	Other Managed Nodes. Managed Nodes
A	Yes	No	
B	Yes	No	
C	No	No	
D	Yes	No	
E	No	No	
X	No	Yes	A C
Y	No	Yes	B E
Z	No	Yes	B C D

FIG. 5

Managed System	Reachable through
A	Direct Through X
B	Direct Through Y Through Z
C	Through X Through Z
D	Direct Through Z
E	Through Y

FIG. 6

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION
(FOR **INTEL CORPORATION** PATENT APPLICATIONS)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below, next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed below) or an original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

INTERNET BASED NETWORK TOPOLOGY DISCOVERY

the specification of which

     __X__   is attached hereto.
     _____ was filed on (MM/DD/YYYY) _____ as
            United States Application Number _____
            or PCT International Application Number_____
            and was amended on (MM/DD/YYYY) _____.
                                  (if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above. I do not know and do not believe that the claimed invention was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, and that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months (for a utility patent application) or six months (for a design patent application) prior to this application.

I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d), of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

INTEL CORPORATION

<u>Prior Foreign Application(s)</u>

(Number)	(Country)	(Foreign Filing Date - MM/DD/YYYY)	Yes	No
(Number)	(Country)	(Foreign Filing Date - MM/DD/YYYY)	Yes	No
(Number)	(Country)	(Foreign Filing Date - MM/DD/YYYY)	Yes	No

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below:

Application Number	(Filing Date – MM/DD/YYYY)
Application Number	(Filing Date – MM/DD/YYYY)

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

Application Number	(Filing Date – MM/DD/YYYY)	Status -- patented, pending, abandoned
Application Number	(Filing Date – MM/DD/YYYY)	Status -- patented, pending, abandoned

I hereby appoint the persons listed on Appendix A hereto (which is incorporated by reference and a part of this document) as my respective patent attorneys and patent agents, with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

Send correspondence to ___Joseph A. Twarowski___, BLAKELY, SOKOLOFF, TAYLOR &
(Name of Attorney or Agent)
ZAFMAN LLP, 12400 Wilshire Boulevard 7th Floor, Los Angeles, California 90025 and direct
telephone calls to ___Joseph A. Twarowski___, (408) 720-8300.
(Name of Attorney or Agent)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole/First Inventor _____Arvind Kumar_____

Inventor's Signature _____ Date _____

Residence _____Beaverton, Oregon_____ Citizenship _____INDIA_____
                          (City, State)   (Country)

Post Office Address ___17942 NW Dustin Lane_____
                              __Beaverton, Oregon_____

<u>APPENDIX A</u>

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APPENDIX B

Title 37, Code of Federal Regulations, Section 1.56
Duty to Disclose Information Material to Patentability

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclosure information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclosure all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§1.97(b)-(d) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) Prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) The closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made or record in the application, and

(1) It establishes, by itself or in combination with other information, a prima facie case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability.

A prima facie case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden-of-proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application;

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

INTEL CORPORATION

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